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P2 Pontamine blue vs. Peach Borer eggs!
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BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

11 Tree medication versus [illegible].

19 [illegible] vs. College [illegible].

NEWS LETTER

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UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

NEWS LETTER

FOR NOVEMBER 1934

Vol. II, No. 1 (Not for publication) January 1, 1935

FIELD LABORATORIES AT BELTSVILLE, MD.

Considerable progress has been made this fall in the construction of the laboratories on the Bureau of Entomology and Plant Quarantine area at the Beltsville Research Center. These laboratories are located on a plot of about 60 acres, approximately 1.7 miles from Beltsville, and are grouped about a small lake. The buildings under construction at the present time consist of a main laboratory, a laboratory head house, four greenhouses, and two mushroom houses. The main laboratory is 110 feet long by 41 feet wide and consists of two stories and a basement, the latter being two-thirds above the ground. There are 31 laboratory units in the building, each approximately 16 feet square, together with four constant-temperature rooms, each 7-1/2 by 15 feet, and three cold-storage rooms, providing approximately 5,000 feet of refrigerated space. The building is of concrete and cinder-block concrete with brick facing. It is practically fireproof in construction, the windows having metal frames, and the doors and door jambs being of metal. The floors of the first two stories will be asbestos tile laid on cement. The floor of the basement will be cement, except for the honey laboratory, which will be tiled. The roof is to be of slate. Provision has been made for a heating plant in the basement and also for a shop. The foundation of the building is completed and the walls are completed nearly to the second floor.

The greenhouses and the head house are located about 250 feet from the main laboratory. The laboratory head house is approximately 80 feet long by 35 feet wide and comprises eight rooms on the first floor. The boiler room, containing the heating plant for the greenhouses, is located in the basement. A spacious attic, 45 by 35 feet, is over the central part of the building. Five laboratories are provided, each of which is about 17 by 15 feet, together with potting room, storage space, and a treatment room for general use. The building is of brick with slate roof, the walls being unfinished brick on the inside, with a beamed ceiling. The flooring of the laboratories is of asbestos tile over concrete.

The greenhouses are four in number, three of them being 75 by 29 feet and 7 feet high at the eaves. The fourth is 20 feet wide and is divided into nine compartments, eight of which are 8 feet 4 inches by 14 feet 4 inches in size, the partitions being of glass. The compartments open into a common glazed passageway. A small propagation house 17 feet long by 6 feet wide is provided.

The mushroom houses are 32 by 18 feet, two stories high, and are of cinder block, stucco on the outside with brick quoins on the corners and doorways. The roof is of slate with the exception of the boiler room, which is between the two buildings. These buildings are enclosed, the roof being in place, although the heating equipment has not yet been installed.

Consideration has been given to the ground allotted to the Bureau and provision made for locating additional structures that may be required in the future.

L. A. Hawkins, in charge of the Division of Control Investigations, is acting as the Bureau's representative in supervising this construction work.

FRUIT INSECT INVESTIGATIONS

Parasites control woolly apple aphid in Washington.--In 1930 and 1931 M. A. Yothers, of the Wenatchee, Wash., laboratory, introduced the parasite Aphelinus mali Hald. into the Wenatchee district, in the hope that it would be of value in controlling the woolly apple aphid (Eriosoma lanigerum Hausm.), which is an important factor in causing perennial canker in apples. These parasites were first established in a large cage built over an apple tree. The species has now spread over the greater part of the principal apple district in this vicinity. In many of the orchards it has already effectively checked the woolly apple aphid.

Screening raisins reduces raisin moth infestation.--Using a soil sifter of the rolling type developed at the Alhambra, Calif., laboratory, equipped with a screen of 1/4-inch mesh and with 2 chains for stopping the moving sieve abruptly at both ends of the track, H. C. Donohoe, of the dried-fruit insects laboratory at Fresno, attempted to reduce infestation in three varieties of raisins. The fruit was screened after drying on spread trays and subsequent drying on stacked trays or rolled paper trays had been completed. The numbers of larvae of Ephestia figulilella Greg. per ton, together with the percentages of reduction, are shown below.

Variety	Before sceening	After screening	Reduction
	Number	Number	Percent
Thompson Seedless	41,693	11,587	72.2
Thompson Seedless (paper trays)	2,898	167	94.2
Thompson Seedless	89,075	31,152	65.0
Muscat	22,296	16,333	26.6
Sultana	133,302	49,201	63.1

Pontamine blue dye is toxic to peach borer eggs.--Oliver I. Snapp and J. R. Thomson, Jr., of the peach-insect laboratory at Fort Valley, Ga., found a year ago that eggs of Synanthedon exitiosa Say deposited on blue blotting paper used in the insectary work failed to hatch. It was learned from the manufacturer of this paper that one of the important constituents of the dye used was known as "pontamine blue." During the 1934 season, experiments were conducted with this dye and it was found that it killed 96 percent of the peach borer eggs when used at a strength of 64 g to a gallon of water.

Northwestern apple growers use codling moth bands.--E. J. Newcomer, of the Yakima, Wash., laboratory, found in the course of a recent survey that 40 percent of the apple growers in the Yakima district are now using chemically treated bands for control of the codling moth. He also noted that not more than half a dozen of the orchards in the Yakima and Wenatchee districts show evidence of having been banded in 1933 but not in 1934, indicating that very few growers discontinue the practice after once adopting it.

MEXICAN FRUIT FLY CONTROL

A Mexican fruit fly taken in Texas.--An adult Mexican fruit fly was trapped in a grove north of San Benito, Tex., the latter part of the month. This fly was taken after high winds from the southeast had prevailed for several days; it was captured in a grove having scanty foliage and very little fruit; and during the same week a number of specimens were taken in Matamoros. These facts substantiate the theory of reinfestation of valley groves by wind-drifting flies from Mexico. A slight increase over the preceding month was noted in the numbers of Anastrepha fraterculus Wied., A. serpentina Wied., A. sp. "X", and A. pallens Coq., taken. Two specimens of an undescribed Anastrepha, in all probability a seed feeder, were also taken in the traps. The first papaya fruit fly taken in several months was trapped in the Pharr district.

Fruit flies collected in Mexico.--Six adult A. ludens were trapped in Matamoros. Three of these were females but none were gravid. Inspections of fruit imported to the Matamoros market resulted in the taking of larvae of A. ludens, A. striata, A. fraterculus, and a species of Rhagoletis. Of interest in showing a possible method of dispersal of the fruit fly, was the finding of 7 larvae and 1 pupa in the cracks of the floor boards of a car in which oranges had been transported to Matamoros from Monterrey. The traps located on the ranches along the Mexican side of the river from Matamoros to Rio Rico, were not operated during the month on account of the unsettled conditions due to the agrarian troubles.

Fruit-fly inspection station opened.--The road-traffic inspection station, 35 miles north of Edinburg, Tex., was opened on December 9. This station was operated on a 24-hour daily basis. There was a steady movement of fruit shipped from the valley throughout the month, a total of 1,101 carloads having been moved by rail and truck. Confiscations were light.

DATE SCALE CONTROL

Date scale work nearing completion.--During the month of November inspection was continued in the infested districts in the Coachella and Imperial Valleys, Calif., and surveys were made there and at Yuma, Ariz., to determine the amount of clean-up work remaining to be done. No parlatoria date scale has been found in the Imperial Valley since February 1934, and on only one property since March 1933. In the Coachella Valley, the largest date-growing area, the last scale was found in November 1931; in the Salt River Valley in October 1932; and at Yuma in December 1930.

CEREAL AND FORAGE INSECT INVESTIGATIONS

Drought in Southwest reduces stored-grain pests.--R. T. Cotton, Manhattan, Kans., reports that stored grain in the Southwest appears to be in better condition from the standpoint of insect infestation than it has been for 4 years. This is apparently due to the extreme hot and dry weather of the past season. Wheat coming into the elevators is extremely dry. Weevils will not breed in wheat having a low moisture content.

Cadelle appears early in Kansas mills.--According to Geo. B. Wagner, Manhattan, Cadelle larvae are beginning to show up in the monthly collections from the machinery of flour mills in the Kansas milling area. Ordinarily this insect does not appear in numbers until midwinter or later, when it often outnumbers the flour beetles.

Many chinch bugs are hibernating in Kansas.--W. T. Emery, Manhattan, reports that population counts of chinch bugs per square foot of sod taken the latter half of November indicated that a large number had found protection in winter quarters. Sixty-two 1-sq. ft. samples were taken in 13 counties. Two counties near Manhattan produced an average of 14 bugs per square foot; 5 counties of northeastern Kansas, an average of 45 per square foot; and 6 counties of southeastern Kansas, 68 per square foot. The two highest counts were 576 in Crawford County, in southeastern Kansas, and 365 in Marshall County, in northeastern Kansas. The samples were taken from roadsides.

New nematode attacks corn ear worm larvae in New Jersey.--W. H. Larrimer, Arlington Farm, Va., reports: "While examining the ear worm hibernation cages at Moorestown, N. J., on November 26, I found that in one of the cages practically all of the pupae had been killed, apparently by some disease. I sent some of these pupae to Vera K. Charles, of the Bureau of Plant Industry, for examination. She reported that they were heavily infested with nematodes and sent the material on to G. Steiner, who states that this is a very interesting find and possibly a new species of nematode. Dr. Steiner says: 'Before long we will be able to send you a description of the new form, which we now believe is different from the parasite of the Japanese beetle, although closely related to it. The pupae submitted are full of nematode larvae, which we think will be suitable for further infection experiments.'"

Hessian fly resistance inherited in wheat hybrid.--W. B. Cartwright, Sacramento, Calif., reports that, in cooperation with the Bureau of Plant Industry, a cross between Dawson, a wheat variety resistant to hessian fly in California, and Poso, a susceptible wheat, was tested under field conditions in 1934. On a factorial basis, a tentative interpretation of the genetic data from 185 F_3 rows indicates the probability that two factors and a 15 to 1 ratio are involved in the cross. The data also indicate complete susceptibility to be recessive. Stocks from 65 resistant hybrid rows become bases for back-crosses and for continuing the breeding for a Poso wheat that will be resistant to the fly. The postulated two factors for resistance have not definitely been identified. It is possible that lines having A and B factors may be obtained in the back-crosses already made in 1934.

Forecast of 1935 grasshopper infestation in California.--According to C. C. Wilson, Sacramento, 496 stops have been mapped, and 4,415 acres of grasshopper egg beds located in California. The highest count of egg pods per square foot was 1,100, or approximately 29,700 eggs. The survey indicates that 100,000 acres of infested territory will require poisoning in 1935. Approximately 500 tons of bran will be necessary to hold the grasshoppers in check. Larvae of Bombyliidae and Meloidae have, in some areas, destroyed large numbers of grasshopper eggs; a maximum of 68 percent was observed attacked by larvae of the bee fly.

Melanoplus mexicanus Sauss. breeds from March to November in Imperial Valley.--Mr. Wilson also reports that observations made from November 7-10 showed the grasshoppers in all stages of development. It becomes more apparent that there are at least two generations, and probably more, as adults and nymphs have been present from April to November. It is believed that the generations may be entirely dependent on soil moisture (obtained only through irrigation), as the temperature from March through November is sufficiently high to cause hatching of the eggs.

Method of preserving tin salve boxes.--F. F. Dicke, Arlington Farm, Rosslyn, Va., says that the common tin salve box is widely used at many laboratories for collecting and rearing insects. One of the objectionable features about these boxes is their rapid deterioration from rust, especially when not in use. Rusty boxes are always undesirable in rearing insects and are difficult to open. To prevent rusting a self-emulsifying spray oil has been employed for 3 years on salve boxes used for rearing larvae. The boxes are boiled from 10 to 15 minutes in water to which the self-emulsifying spray oil has been added at the rate of 15 cc per gallon. The boxes and lids are then spread out to dry, the evaporation of the water leaving a thin film of oil. Boxes treated in this way have been used repeatedly for rearing purposes with no deleterious effect to larval development from the oil film. The oiled boxes may be opened and closed much more rapidly and with greater ease, thus minimizing injuries caused by ragged edges on the boxes and lids. The chief benefit, however, is the preservation of the boxes while in storage.

Parasitization of wheat joint worm in Oregon.--T. R. Chamberlin, Forest Grove, Oreg., reports that in the Molalla colony in 1934, infestation by Harmolita tritici Fitch is the lowest so far recorded. Late in November, parasitization of H. tritici in a field near the heart of the Molalla colony having an infestation of 6 percent of the culms was analyzed. It was encouraging to find that, notwithstanding the low infestation, parasitization had not been reduced, but was higher than previously noted. The material showed the following conditions:

Average *Harmolita* galls per infested joint	6.3	
Survival of *H. tritici* in galls	11.7	percent
Parasitization by *Ditroponotus aureoviridis* Crawf.	37.8	percent
" " *Eurytoma parva* (Gir.) Phillips	30.2	percent
" " *Eupelmella vesicularis* Retzius	1.7	percent
" " *Eupelmus allynii* French	11.7	percent
" " *Decatoma amsterdamensis* Gir.	4.2	percent
" " other and/or undetermined parasites	2.5	percent
Total parasitization	88.3	percent

The number of additional *Harmolita* destroyed by *Eurytoma* that entered more than one cell increased the destruction by this species to 42.8 percent of the original number of *Harmolita* present and increased the total destruction by all the parasites to 90.7 percent. *D. aureoviridis* was secondary in 13.3 percent of the cases, all on *E. parva*. *E. allynii* was secondary in 57.1 percent of the cases, all on *E. parva*. *E. vesicularis* was secondary in half of the cases, all on *E. parva*. *D. amsterdamensis* was secondary in at least 40 percent of the cases. By including the *Eurytoma* destroyed by secondaries, as well as those that entered more than one cell, 53.9 percent of the original number of *Harmolita* were destroyed by *Eurytoma*. Record of parasitization in this material differs from other records of the last few years in that it shows an increase in parasitization by *D. aureoviridis* and *E. allynii*. Stubble heavily infested with jointworm was very scarce in the spring of 1934 and it is believed that this increase in parasitization by *D. aureoviridis* was caused in part by parasites issuing from various grasses, where this species parasitizes other *Harmolitas*, especially velvetgrass, which is very abundant in the neighborhood of the field studied. The increase in *E. allynii* was due in part to those issuing from hessian fly.

JAPANESE AND ASIATIC BEETLE INVESTIGATIONS

Disease among Japanese beetle larvae.--During the past month the work of isolating the infecting organisms from field-collected grubs at the Moorestown, N. J., laboratory, has been continued by I. M. Hawley and S. R. Dutky. Several additional organisms have been shown to be pathogenic to the Japanese beetle larvae upon direct injection into healthy larvae. Field tests to determine the survival of the pathogens in the soil and the degree of infection of healthy grubs by the organisms have been started. Soil inoculated with approximately 10 billion cells of each of 9 pathogenic organisms were sprinkled over the grubs and the plots were then filled in. Three uninoculated plots were used as controls. Suspensions of the blood of milky grubs tested in the laboratory in saline solutions showed that there may be at least 15 billion spores of the causal organism in the body fluids of a single grub. Slants of blood agar and nutrient agar were inoculated with the saline blood suspension, and after several days at 30° C. (86° F.) discrete dewdrop colonies developed on the blood agar, whereas the nutrient-agar slants remained free from growth. Microscopic examination of the growth showed it to be made up of long, slender motile rods. To date these have not sporulated, therefore they could not be identified with the spindle-shaped spores from the milky grubs. Inoculations into healthy grubs were made too recently to shed any light on the problem. Fifteen healthy grubs from Philmont, Pa., which had been observed for 18 days to make sure that they would not develop the disease spontaneously, were used in an inoculation experiment to show that direct injection of the causal organism would produce the disease. Five grubs injected with 0.01 cc of a 0.5-percent saline solution served as controls, and 10 grubs were injected with 0.01 cc of a 0.5-percent saline suspension of the blood from a milky grub (the suspension containing 25 x 10^7 spores per cc). No change was observed in the grubs injected with the saline suspension until 1 week later, when 7 out of the 10 grubs showed a slightly milky appearance. To date, 10 days after injection, the 7 grubs appear distinctly milky.

Method for conducting larval surveys in the field.--W. E. Fleming and F. E. Baker, Moorestown, report that this project was undertaken in September to determine the proper procedure for conducting larval surveys in the field. Four 2,500-sq.ft. plots were surveyed and the number of larvae found in each square foot were plotted on a large chart. Two of these surveys were made in pasture and two in cornfields. The data have not been completely analyzed but the following results are apparent: (1) The relative standard error of the mean is greatly influenced by the size of the individual unit used in the survey and the percentage of the area surveyed. It is apparent from our observationsthat the most accurate survey is obtained with the square-foot units. (2) Using the square-foot units, it was found that the relative standard error of the mean was a function of the area surveyed and of the average number of larvae per square foot in the plots. It is planned to complete this work in the near future, when it is expected that the accuracy of the different methods of surveying can be definitely determined.

Propagation of Tiphia popilliavora Roh.--T. R. Gardner, Moorestown, reports that laboratory propagation of the Korean strain of the Japanese beetle parasite T. popilliavora and crosses of this strain with the Japanese form of T. popilliavora, started on September 13, was brought to a close on November 12. From 235 Korean-strain females mated with Korean-strain males a total of 16,276 parasitized grubs were obtained, an average of 69.3 eggs oviposited per female; from 17 Japanese-strain females mated with Korean-strain males, a total of 1,082 grubs were parasitized, an average of 63.6 eggs oviposited per female; from 5 Korean-strain females mated with Japanese-strain males a total of 366 parasitized grubs were obtained, an average of 73.2 eggs oviposited per female. The life of the females while in actual oviposition under laboratory conditions ranged from a few days to 57 days for the Korean strain and from a few days to 45 days for the Japanese strain. The highest total number of eggs laid by one Korean-strain female was 126, and the highest total laid by one Japanese-strain female was 109. Reporting on the Yokohama strain of this parasite, M. H. Brunson, L. B. Parker, and R. T. White state that on October 19 and November 1 shipments of adult T. popilliavora, collected at three different locations in the vicinity of Yokohama, were received from Japan. As the habits of the insects at each of these localities are different and also slightly different from the habits of the species first collected at Koiwai in 1920, the recent material was considered to represent distinct strains of this species. It is hoped that this material will be better adapted to conditions in this country than the strain which has been established for some years, originally collected at Koiwai. Due to the lateness of the arrival, it was decided that the adults would not be liberated but would be used in propagating material for use next year. The methods used in propagation were fundamentally the same as those used in propagating other *Tiphia*, the only variation being that breeding cans were examined every second day instead of daily, because of the large number of females it was necessary to handle. From a total of 3,241 females, 34,518 parasitized hosts were obtained.

JAPANESE BEETLE CONTROL

Mild weather stimulates nursery inspection.--Mild weather during the latter part of November resulted in considerable activity in the nurseries and was largely responsible for continued demands for inspection and certification of stock. Two temporary inspectors located at Westfield, Mass., inspected nursery stock for winter storage. Weather conditions permitted strawberry plant growers on the Eastern Shore of Maryland to continue shipments of certified material. Nursery activities in New Jersey have kept all inspectors busy. In southern New Jersey it was necessary to add several inspectors. Nursery stock continued to move from the Philadelphia area under certification, although in small amounts and mostly to southern points. At the end of the month, plants for Christmas sale were moving between dealers, thus adding to the seasonal demands for certification.

New methods of treatment being devised for ridding potted stock of Japanese beetle.--The Japanese beetle quarantine and research organizations are cooperating with a number of New Jersey nurserymen and greenhousemen in experiments to determine the effectiveness of paradichlorobenzene in killing Japanese beetle grubs infesting potted stock.

Elm sanitation survey in Dutch elm disease control area.--Tagging of dead and more than half dead elm trees in the tri-State work areas progressed satisfactorily during November. It is planned to remove such trees before the next spring emergence of beetles. In New York, 14,048 dead and dying elms have been located and tagged for removal this winter. Removal of 121 trees of this character already has been accomplished. These 14,169 trees constitute about 60 percent of all dead and dying elms in the infected area and the 10-mile protective zone of New York. In New Jersey, at the end of November, 3,645 dead and dying trees had been located and marked, 826 of these having been found in an area of less than 20 square miles. The latter elms are located in woodland and swamp areas where it had been anticipated the greatest number of dead elms per square mile would be found. In the New Jersey State control organization, four supervisors were assigned to interview owners of diseased elms and obtain releases for removal of the trees. Dead and dying elms located in Connec cut in November brought the grand total for that State to 3,301.

Inspection of evergreen products requires enlarged gypsy moth force.--Individual inspection of each tree in carload shipments of Christmas trees required the assignment of 21 temporary inspectors to inspection centers in the lightly infested gypsy moth area of Maine, New Hampshire, and Vermont. The trees were inspected after their assembly at railroad loading points. Nine temporary inspectors were stationed in southern Vermont, where they inspected lots from which evergreen boughs were cut. For the purpose of determining that laurel used in the manufacture of Christmas wreaths, roping, and set pieces originated at certified lots, a single inspector was stationed at New Salem, Mass., and two inspectors in southern Vermont.

Shipper and common carrier prosecuted for gypsy moth quarantine violation.--In the Bureau's first prosecutions for violations of the gypsy moth quarantine in over 10 years, Fred E. Grant, of Cherryfield, Maine, and the Maine Central Railroad Company were each fined $25 for shipment and transportation on September 29, 1934, of 17 cords of hardwood from Harrington, Maine, to Elkins Park, a suburb of Philadelphia, Pa. While inspecting a carload of wood for the same shipper, the district inspector at Bangor overheard a conversation that led him to investigate a carload previously moved without inspection. The necessary legal papers were turned over to the United States Attorney on November 5 and the defendants were arraigned and fined at Bangor on November 13.

Increase in gypsy moth egg clusters removed from inspected products.--Over twice as many gypsy moth egg clusters were removed from products inspected in November 1934 as in the same month of 1933. This year's November total is 432 egg clusters. In the same month last year, 210 egg clusters were removed and creosoted.

Stubble count determines extent of corn borer infestation on Long Island.-Inspections are now in progress by the corn borer inspector stationed on Long Island of cornfields throughout the different sections of the island. In thoroughly canvassing the island, five fields in each section and 125 stubble in each field will be examined. The stalks removed for fodder were cut fairly close to the ground this year. Nevertheless borers are quite evident in many fields. It is anticipated that the heaviest infestation will be found on the eastern end of the island, as dahlia plants inspected in that section contain the largest number of borers. In the three most heavily infested fields found during the month the infestation was as follows: 22 borers in 125 stubble examined in a 12-acre field; 24 infested stubble among 125 selected at random in a 3-acre field; and 16 borers among 125 stubble examined in another 3-acre field.

Cannery appeals to corn growers to rid their fields of borers.--A prominent canning factory located at Essex Junction, Vt., sent each of its growers the following letter: "During 1933 and 1934 there has been a considerable infestation of corn borers in the corn planted for the Essex Junction factory. It is to your interest, as well as to ours, that all possible measures should be taken to keep corn borers from increasing. One of the best ways to control the borers is to destroy them in the fall." After mentioning various measures of control, the letter concludes: "A little extra care this fall may mean a great saving to you and to your neighbor in the next year's crop. Please cooperate with us and with the Vermont Department of Agriculture in doing everything possible to destroy the borers in 1934 and thus preserve the 1935 corn crop."

FOREST INSECT INVESTIGATIONS

Pine tip moth in Illinois.--R. C. Hall, of the Columbus, Ohio, laboratory, reports that during a survey in the Central States region last summer, A. G. Chapman, of the Central States Forest Experiment Station, noted numerous instances where the pine tip moth (*Rhyacionia frustrana* Comst.) was damaging planted shortleaf and loblolly pine. All the evidence points to the fact that this planting stock was infested before it was shipped to Illinois, the nearest native pine being about 60 miles distant. One of these areas is a 5-year plantation of 5-year-old shortleaf and loblolly pine at Elizabethtown, Ill. The infestation in this plantation is very heavy, about 95 percent of all tips and laterals being infested. Random sampling indicates populations of about 12 pupae per tip, which means about 350 per tree. The average height of these trees is only about 4 feet. An attempt is being made by the Bureau to control this local infestation by the removal of all infested tips during the coming winter. Time records on the work indicate that by the use of local labor 30 trees per man-hour can be treated.

Black locust injured by cereal and forage pests.--T. E. Snyder, of the New Orleans, La., laboratory, reports that during the last few years millions of black locust seedlings have been grown in plantations in the Southern States to be used in the various emergency planting projects. In this connection a number of crop pests, such as the three-cornered alfalfa hopper (*Stictocephala festina* Say) and the lesser cornstalk borer (*Elasmopalpus lignosellus* Zell.), formerly unknown as enemies of this tree, have been doing considerable damage. In 1933 one nursery that was planted to provide 200,000 seedlings produced only about 25,000, because of the feeding of a small membracid.

Anobiid beetle damages furniture.--Dr. Snyder also reports that an interesting European anobiid has recently been damaging furniture and the woodwork of buildings in Florida and Louisiana. Its work is often confused with that of dry-wood termites. A short publication has been prepared on this insect.

Insect attack in cutover lands in California.--J. M. Miller, of the Berkeley, Calif., laboratory, reports that during the summer of 1934 a study of the insect problems that develop in the growing stock left on the ground after the mature timber has been cut, was carried on by the Berkeley laboratory, in cooperation with the Forest Service of Region 5. Areas in central and northern Califor nia, where logging had been done from 5 to 40 years ago, were included in these studies. A total of 30 sample plots, covering 12,000 acres of land that had bee logged by various methods of regulated cutting, were covered by intensive survey Results have shown that in the pure ponderosa pine type the hazard from bark-beetle attack to reserve trees, left as cover after logging, is very high. On some areas nearly all of the larger trees left by the lumbermen have been killed within 15 years after the area was logged. Still another set of entomological problems was found in the insects which attack the younger trees of the second-growth class. Most important of these problems was the injury caused by a pine tip moth, *Rhyacionia pasadenana* Busck. The damage occurs mainly on reproductions up to 6 feet in height. Repeated killing of the terminal shoots markedly deforms the trees. This insect is most prevalent in open stands of pine reproduction that are unshaded by mature trees.

Long growing season of 1934 favors western pine beetle.--Brood development in the spring of 1934 started in California about 1 month earlier than normal. In northern California the third seasonal generation reached the overwintering stage, while in central California three generations were completed and a partial fourth has reached the overwintering stage. Development for 1934 exceeds by one generation any previous records for seasonal development. These favorable conditions in 1934 resulted in the rapid building up of western pine beetle epidemics, particularly in northeastern California. In many areas the beetle population has built up to epidemic conditions, which now exceed the infestations that preceded the heavy winter-kill of December 1932.

Lodgepole pine needle miner shows rapid spread in Yosemite.--National park surveys during September 1934 indicated that the needle miner Recurvaria milleri Busck greatly increased the extent of the infested areas in the high Tuolumne watersheds during the flight season of 1933. As these new epidemics will undoubtedly extend the areas of dead lodgepole forests within the park, the forest cover on the intensively used camp-ground areas around the Tuolumne Meadows is now threatened. Because of the seriousness of this problem, the Berkeley laboratory continued experiments during September 1934 in an attempt to develop a method of protecting individual trees from defoliation. Light oils applied during the early stages of attack in the fall of 1933 gave good control, mortality as high as 97 percent being obtained. Applications during the second season of feeding in 1934, after the larvae were half grown, were far less effective, causing a mortality of only 22 percent.

Pine shoot moth reduced in Connecticut.--H. J. MacAloney, of the New Haven, Conn., laboratory, reports that in connection with the C. C. C. project for control of the European pine shoot moth (Rhyacionia buoliana Schiff.), the fall inspection of plantations by the Connecticut Agricultural Experiment Station is under way. Up to November 15, 51 plantations totaling 593 acres have been inspected and in 42 of these no larvae were found, while the infestation in the remaining 9 was reported as very light. In 1933 these plantations were reported as 9 heavy, 10 medium, 26 light, and 6 having no infestation. The very noticeable decrease in infestation in these plantations was caused partly by death of the larvae during the severe winter and partly by the very efficient control work. It is believed that this situation prevails throughout the northwestern, northeastern, and eastern parts of the State. Control was not undertaken in the southwestern part of the State, in New Haven and Fairfield Counties, and the infestation there is still noticeable.

Tree medication for control of the mountain pine beetle.--W. D. Bedard, of the Coeur d'Alene, Idaho, laboratory, states that for several successive years emergency appropriations made it possible to experiment more extensively with tree medication as a possible means of controlling the mountain pine beetle in western white pine. The first project was instituted in 1933 to ascertain whether the method of injection could be applied successfully by ordinary unskilled laborers, and to test the practicability of the method under actual control conditions. The results showed that the technic was easily mastered by the men and that more trees could be treated at a smaller cost than by present methods. The 1934 experiment tested various poisons not only for their ability to destroy the mountain pine beetle broods but also as wood preservatives to protect the trees from wood-destroying insects and decay. Work was begun 1 month earlier than in 1933 because partial kill in some of the 1933 trees indicated that they were injected too late in the season, after too much blue-stain development had occurred. A total of 202 trees were treated with various dosages of mercuric chloride, zinc chloride, copper sulphate, sodium fluoride, and sodium arsenate. Complete tree data were taken for each tree to answer some of the questions which arose from the analysis of the 1933 injections. These trees will not be examined until 1935, as it has been found that mortality will not be complete until then.

Natural control of pine tip moth.--L. G. Baumhofer, Coeur d'Alene, reports that, from indications found during fall examinations, extremely high temperatures in July apparently were detrimental to several insects injurious to pine plantations in the Nebraska National Forest. Young larvae of the second generation of Rhyacionia frustrana bushnelli (Busck) evidently suffered a very heavy mortality, as the damage to pine leaders was much less than that caused by the first generation. Normally, with parasitization low, as was the case this year, the second generation is at least twice as destructive as the first. With the pitch moth (Dioryctria ponderosae Dyar) an examination of burrows under the bark showed only a 60-percent emergence, 40 percent of the insects having died during July in the mature larval and pupal stages. The normal mortality for these advanced stages is less than 10 percent, and in 1933 was only 6 percent. A record maximum temperature of 109° F. was recorded on July 15 in a weather shelter in the open; however, in stands of tall trees and in protected hollows in the sand hills temperatures from 113° to 115° in the shade were noted. Excessively high temperatures were also continuous for the unusual period of several weeks in July.

GYPSY AND BROWN-TAIL MOTH CONTROL

Scouting in barrier zone.--The scouting force was increased somewhat during the first part of November in order that work planned for the year in the Massachusetts and Connecticut portions of the gypsy moth barrier zone might be done. A total of 60 former employees were reinstated. To and including December 1, a total of 18 infestations and 961 egg clusters have been located in the Massachusetts portion of the zone and 12 infestations, totaling 5,096 egg clusters, in the Connecticut portion. The work planned for the Vermont portion of the zone has been completed and no infestation found.

Gypsy moth in Pennsylvania.--In the Pennsylvania area scouting work during November was confined chiefly to intensive work within a one-half-mile radius of assembling cages where male moths were taken last summer, and to making a rough survey of the woodland areas in the region where considerable infestation is known to exist, in order to determine the infestation conditions in the wooded sections of these towns. Only two infestations have been found in territory not previously known to be infested.

Both were discovered by checking around assembling cages where male moths were taken. No infestation has been found, however, within a one-half-mile radius of several other cages in outside territory where moths were captured last summer. Although numerous infestations have been found in the woodland areas in towns where rough scouting has been done, a large percentage of the infestations contain relatively few egg clusters scattered over a rather large area.

Gypsy moth in New Jersey.--By cooperative arrangement with the State of New Jersey a small force of State and Federal men took up scouting work during November in Morris Township, Morris County, N. J., the location where male moths were taken at cages last summer. By the end of the month 17 new and 1 old egg clusters had been found by the State force and 4 new egg clusters had been located by the Federal crew in woodland areas not far from cages where moths had been taken. The distance between the infestation located by the State force and that located by the Federal force is approximately one-half mile. Most of the egg clusters were deposited on rocks, stumps, and debris on the ground or on the lower parts of the trees. As there is considerable debris in the localities where these egg clusters were found, progress has been rather slow. On days unfit for scouting, the men burned as much of the debris as possible. A small force of Federal men are also engaged in scouting in the vicinity of an assembling cage in Pahaquarry Township, N. J., where a single male gypsy moth was taken last summer. No infestation has, as yet, been found by this crew. Pahaquarry Township borders the Delaware River and is located in Warren County, N. J., approximately 8 miles northeast of Stroudsburg, Pa.

Ropes to replace irons in shade tree work.--The men engaged in scouting and clean-up work have formerly used climbing irons in order to reach gypsy moth egg clusters deposited on trees which could not be creosoted from the ground with brushes attached to long bamboo poles. Although there has been no special criticism of the use of irons for getting into trees in woodland areas, this method of climbing shade trees along highways and in villages is rather objectionable because of the ugly-looking scars left in the trees, and also because of the possibility of spreading infection from diseased to healthy trees. It was recently decided to train our field force in the use of ropes for climbing, particularly when it is necessary to work in shade trees.

Gypsy moth control crews increased.--The gypsy moth work has been continued during the month by men in certain C. C. C. and V. C. C. camps in Vermont, Massachusetts, and Connecticut, in part of the area east of the barrier zone and west of the Connecticut River. These crews have been increased to approximately 450 men. Most of the work this fall has been confined to intensive work at the sites of infestations found last winter by C. C. C. and N. R. A. crews. The work has consisted of creosoting egg clusters, burning up fallen limbs and trees, and cutting out broken trees and those with cavities in them. Such clean-up work will result in speeding up future gypsy moth work at these places. Since the first of July, the men have examined tree growth along 88 miles of roadside and have scouted 37,757 acres of woodland and open country. They have examined over 112,000 trees growing in the open, have done chopping and burning work on 419 acres, and have destroyed over 2,000 worthless trees. In Massachusetts, 159,723 egg clusters have been creosoted; in Connecticut, 54,849; and in Vermont, 18,060, making a total of 232,632 clusters treated this fall.

PLANT DISEASE CONTROL

Barberry eradication work closed in Virginia.--G. E. Matheny brought eradication activities in Grayson County, Va., to a close on November 30. During May, June, and November, Mr. Matheny with one crew of from 10 to 18 men destroyed more than 600,000 native barberry bushes in Elk Creek Valley. *Berberis canadensis*, the species most commonly found in southwestern Virginia, grows in patches in pastures and along stream banks, fence rows, and the edges of timber. Few bushes are found above the timber line.

White pine blister rust survey.--During October surveys were made in 91 townships in the Northeastern States, resulting in the mapping of 46,837 acres for control work and the elimination of 16,743 acres that contained insufficient white pine for inclusion in the control areas. A total of 6,284 man-hours were spent on this work. In the West surveys have been completed on all white pine areas not previously surveyed in the Inland Empire, thus making it possible to define with a high degree of accuracy the limits of the areas on which control work should be carried on. In addition to the 778,190 acres surveyed in the Inland Empire during September and October, 251,240 acres were recently surveyed in California and a reconnaissance covering 25,280 acres was made in Oregon in October on a body of sugar pine approximately 75,000 acres in extent, the largest and finest body of sugar pine in the State.

A new method of Ribes eradication.--A chemical method has been developed as a substitute for hand-pulling or grubbing of large *Ribes* of the "individual bush type", this term being used to refer to *Ribes* growing normally in upland locations as single bushes, in contrast to large bodies of *Ribes* growing along streams. The chemical method consists of cutting the *Ribes* at or below ground level and the application of a small quantity of liquid or dry chemical to the mutilated crown. The choice of chemical is governed partly by the *Ribes* species to be treated and partly by soil conditions. For example, 2 to 3 fluid ounces of Diesel oil or saturated ammonium thiocyanate gives best results on *R. roezli*, a California species usually found on dry ground; and from 2 to 3 ounces of dry ammonium thiocyanate or sodium fluoride crystals has proved to be fully effective on *R. viscosissimum*, an Idaho species that grows on moister soils than does *R. roezli*. For the treatment of *R. cereum*, an average dosage of 0.3 gallon of Diesel oil is recommended. This latter *Ribes* is an important Oregon and California species and often grows in clumps, forming large composite crowns. The Pulaski, a cutting tool which combines the features of an axe and a mattock, appears to be the instrument most generally favored for this work, although a heavy pair of shears, somewhat similar to those used for dehorning cattle, and having an extra long handle, has proved very useful for topping bushes rooted under logs or stumps or in rock crevices. Convenient containers are now being perfected for releasing measured dosages of either liquid or dry chemical.

Treatment of diseased white pine.--During the past season an E. C. W. crew of eight men has been engaged in treating diseased white pines at Acadia National Park in Maine. This park contains a large number of white pines, many of large size, located in groups or along roadways or other points where they have a high scenic value. Before control work was undertaken in the park, a number of these large trees became infected with blister rust and an attempt is now being made to save as many of them as possible. The crew working on this project found 138 trees so badly diseased that they had to be cut down, and 524 trees were treated by cutting out the diseased portions. Sixty-two stem cankers and 1,344 branch cankers were removed, the work requiring 832 man-hours of labor.

COTTON INSECT INVESTIGATIONS

Longevity of boll weevils.--G. L. Smith, J. C. Clark, and A. L. Scales, Tallulah, La., report that two female boll weevils in their longevity tests were still alive on November 1, 1934, and are now entering into their second year. One weevil was from an outdoor hibernation cage provided with leafage and twigs for shelter, in which the weevils were placed November 1, 1933. It was removed on June 21, 1934, having been 232 days without food, and was kept in the insectary throughout the summer and provided with fresh food daily. On November 1, 1934, it was again placed in an outdoor hibernation cage, where it was last seen on November 12. The temperature dropped to 26 °F. on this date and it is probable that the weevil entered the Spanish moss and cornstalks for shelter during its second winter of hibernation. The record of the other female is about the same. It was placed in an outdoor cage with cornstalk shelter on November 16, 1933, and was removed on June 18, 1934. Food was provided during the summer and it was returned to hibernation quarters on November 1, 1934. These are thought to be the longest periods for which weevils have been kept alive.

Weevils going into hibernation this fall.--Reports from several field stations indicate that the number of boll weevils present in the fields and entering hibernation this fall varies considerably in the different sections but averages less than normal for the Cotton Belt as a whole. The weevil damage to this year's crop has also varied, being heavier than usual in parts of the Delta and South Central States and less than usual in the eastern and western parts of the Belt. Seasonal and crop conditions have adversely affected the hibernating weevils in some sections and have been favorable in others.

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Boll weevil population at Tallulah, La.--R. C. Gaines submits the following table which shows the numbers of weevils caught on the flight screens at Tallulah during November of the past 5 years, and the numbers found in the Spanish moss examined after frost.

Year	Weevils caught per screen	Live weevils per ton of moss
	Number	Number
1934--------	106.67	192
1933--------	139.44	365
1932--------	131.50	881
1931--------	91.79	724
1930--------	---	49

Efficiency of improved cotton stalk shaver.--D. A. Isler, of the Bureau of Agricultural Engineering, working in cooperation with the staff of the pink bollworm laboratory at Presidio, Tex., reports on some recent tests with the push-type shaver and windrower developed at Presidio for cutting and windrowing cotton stalks in the pink bollworm clean-up. Changes in design since last season have greatly increased the efficiency of the outfit. Based on tests in cutting 100 acres, the shaver will cover 12.5 acres in an 8-hour day, allowing time for sharpening the knives. From 4 to 6 men were required to bunch the windrowed stalks into piles for burning. At the prevailing rates for labor and gasoline the total costs for cutting and piling were approximately $1 per acre, and these costs can be further reduced if a satisfactory rake can be developed.

Pink bollworm mortality not accounted for.--L. W. Noble, Presidio, Tex., visited the El Paso Valley this month to study the cause of the mortality of pink bollworm larvae. Attention was first called by J. S. Brock, of El Paso, to an unusually large number of dead larvae found in gin-trash collections, and to a lesser number of dead larvae in open bolls in the fields. Inoculation tests were made to determine whether these worms were infected with disease organisms that could be transferred to healthy worms by the puncture method of inoculation. There was no appreciable difference between the mortality of the groups of larvae punctured with needles that had been thrust into the diseased larvae, and that of groups punctured with sterile needles. The average mortality was about 16 percent in 10 days and was probably owing to mechanical injury. Similar inoculations made with the septicemia disease, which occurred in the laboratory in 1932, resulted in 100-percent mortality in 48 hours. There was no evidence of parasitization in the larvae and the cause of their death remains undetermined.

Light traps capture leaf worm moths.--C. F. Rainwater, Florence, S. C., reports that moths of the cotton leaf worm (Alabama argillacea Hbn.) were collected in a light trap at Florence up to November 6, a week following the first killing frost on October 29.

Crop tolerance of arsenic in soils to be tested.--F. H. Tucker, State College, Miss., who is working in cooperation with the soil specialist of the Mississippi Experiment Station, reports good progress on the construction of "bins" for use in experiments on the toxic effect of arsenic on crops grown in different types of soils. The excavation of five plats 82 by 7 feet was completed in November. These pits will be subdivided by concrete walls 4 inches thick and 1 foot high to form 50 bins, each 3 by 6 feet. Soil of the main types used for cotton in Mississippi will be brought in and treated with varying amounts of arsenic to determine the tolerance of cotton and other crops. Approximately 200 tons of soil will be used.

PINK BOLLWORM AND THURBERIA WEEVIL CONTROL

No pink bollworm found in Lower California or in Arizona.--Gin-trash inspections have been completed in the Salt River Valley of Arizona and also in the Mexicali area of Lower California, Mexico. No indications of the pink bollworm were found in either of these areas. This completes gin-trash inspection for the 1934 season, with the possible exception of a small amount which may be examined in the Thurberia weevil area. Field inspections have been performed in the Midland area of Texas in an effort to locate the source of the specimens found in gin trash last month. Every suspected field was given a careful inspection, but no indications of infestation were found and, as only four specimens were found in gin trash, the infestation must be exceedingly light. Inspections at the San Antonio laboratory were begun during the month and have gone forward satisfactorily, with negative results.

Pink bollworm clean-up delayed in Texas.--In the Big Bend area of Texas the farmers expected to make a top crop, therefore many of them did not want their fields cleaned until a killing frost had caused the remaining bolls to open. This naturally limited the acreage available for cleaning and held up the work somewhat. It is of importance to note, however, that practically all of the most heavily infested fields were cleaned before frost and before many of the worms had gone into the ground for hibernation. At the end of the month, stalks had been cut on 1,201 acres, 762 acres had been hand-picked, and material on 727 acres had been burned, which completed the clean-up. This is approximately 200 acres more than had been cleaned at this time last year. The farmers are now making the final picking and within a short time all of the fields will be available. The number of laborers can be increased, and the clean-up should go forward rapidly from now on.

Wild cotton eradication in Florida.--The eradication of wild cotton in southern Florida has been resumed. Most of the work done thus far has been along the west coast and on several of the mainland keys. All preliminary arrangements had been completed for beginning work on Cape Sable the first of December. During the month 269¼ acres were recleaned, from which 56 mature, 150,546 seedling, and 663 sprout plants were removed. The small number of sprout plants found at this time and the small number of seedlings, in proportion to the number originally present, indicates that considerable progress is being made, and the fact that only 56 mature plants previously missed were found at this time, shows that the work is being very satisfactorily done. A number of locations previously cleaned were found to be entirely free of cotton at this time. Poison was applied to stumps of some of the larger plants last year to determine whether it was possible to eradicate the wild cotton by this means. Results were excellent, as only a small proportion of the stumps poisoned have put out sprouts. Quite a few rattlesnakes are being encountered and killed, some of the crews having killed as many as 5 in 1 day. Fortunately none of the men have ever been bitten.

Two pink bollworms intercepted from Big Bend of Texas.--On two occasions during the month material intercepted at the Marfa, Tex., road station was found to be infested with the pink bollworm. Both of these interceptions consisted of a small quantity of seed cotton found on trucks hauling cottonseed from the Big Bend to the Marfa Oil Mill. The first interception, made on November 1, contained 1 living and 2 dead larvae, and the other, made on November 10, contained 29 living and 16 dead larvae. After this last interception, steps were taken to see that the trucks were freed of seed cotton before they loaded seed at the gins. The cooperation of the truck drivers and the ginners was requested and has evidently been given, as no similar interceptions have since been made.

TRUCK CROP AND GARDEN INSECT INVESTIGATIONS

Pin worm damages field-grown tomatoes in southern California.--R. E. Campbell and J. C. Elmore, of the Alhambra, Calif., laboratory, report extensive damage in 1934 to tomatoes in southern California, particularly in Ventura, Los Angeles, Orange, and San Diego Counties, where approximately 7,000 acres of tomatoes were planted for canning purposes and approximately 6,000 acres for table use and shipping. Recent examinations of fruit in typical fields of Orange and San Diego Counties reveal that an average of 15 percent of the green and 50 percent of the ripe fruit were infested with the pin worm (Gnorimoschema lycopersicella Busck) in the summer growing areas, subject to general frost during the winter, whereas an average of 60 percent of the green and 100 percent of the ripe fruit were found infested on the so-called frostless areas where tomatoes are grown in the winter as well as during the summer. Actual losses were difficult to estimate, as much of the slightly damaged fruit was used on local markets and for canning. Two or three entire fields in Orange and San Diego Counties were abandoned after unsuccessful attempts to market the fruit.. Actual crop losses were further augmented by an increase of 15 to 20 percent in the cost of culling and picking. One grower was able to pack only 40 bushels out of a total of 700 bushels harvested from the field.

Indirect control of tomato pin worm.--R. E. Campbell and J. C. Elmore, Alhambra, report that field observations during 1934 have indicated that the following indirect control measures may be effective in combating the tomato pin worm: (1) The destruction of tomato plants from old, infested fields; (2) the destruction of infested fruit; and (3) the destruction of the vines and waste fruit in old tomato fields, particularly in frostless areas.

Derris gives good control of cabbage worms on collards.--W. A. Thomas and L. B. Reed, of the Chadbourn, N. C., laboratory, report that in recent tests with insecticides against the three more common species of cabbage worms on collards, a derris-dust mixture containing 0.5 percent rotenone gave the most promising results. Undiluted calcium arsenate gave almost as good results as derris, but was not as effective against the common cabbage worm. Pyrethrum dust mixtures containing 0.05 percent pyrethrin I and paris green, diluted with 9 parts of lime, gave rather varied results, depending on the time of application and the species concerned. In some of the tests, pyrethrum at the above-mentioned strength gave slightly better results than did the derris-dust mixtures. In general, the afternoon applioations of pyrethrum gave better results than did the morning applications, whereas with paris green morning applications gave better results than those made in the afternoon. The three species of cabbage worms concerned were the imported cabbage worm (Ascia rapae L.), the cabbage looper (Autographa brassicae Riley), and the diamond-back moth (Plutella maculipennis Curt.).

Mexican bean beetle hibernation in Southwest.--J. R. Douglass, of the Estancia, N. Mex., laboratory, reports t at the investigations on the hibernation of Epilachna corrupta Muls. in the Estancia Valley of New Mexico in 1934 confirmed the results obtained in previous seasons, to the effect that the successful hibernation of this insect is confined to the western yellow pine (Pinus ponderosa) association of the transitional life zone, especially where oak trees are associated.

Insecticidal control of lima bean pod borer in California increases yields.--Rodney Cecil, of the Ventura, Calif., laboratory, reports than an analysis of the results obtained from insecticides tested against Etiella zinckinella Treit. in 1934 revealed that applications of undiluted sodium fluoaluminate increased the yield of lima beans approximately 72 percent as compared with adjacent untreated plots. The reason for the increase in yield of treated plots in comparison with check plots is probably attributable to the protection afforded by the insecticide, as it is known from field observations that the entrance of newly hatched pod borer larvae into small pods causes such pods to drop. Substantial increases in yield were also obtained by the application of barium fluosilicate.

High mortality of pea weevil in Austrian winter field peas.--A. O. Larson, of the Corvallis, Oreg., laboratory, reports that recent examinations of Austrian winter field peas grown in 1934 have shown a high natural mortality of Bruchus pisorum L. Nearly half the weevils contained in 61 200-pea samples of unfumigated, uncleaned peas brought into five different Oregon warehouses after the period when all living weevils had had a chance to develop, were found dead. A total of 1,503 living weevils and 1,397 dead ones were found in these samples, indicating a natural mortality of approximately 48 percent.

Cigarette beetle preferences in smokes.--A. W. Morrill, Jr., of the Richmond, Va., laboratory, reports that in recent laboratory tests of the relative attractiveness of various manufactured cigarettes to larvae of Lasioderma serricorne Fab., it was shown that the "de-nicotinized" cigarettes were less attractive to the cigarette beetle than were the various brands of medicated and ordinary cigarettes. Apparently in the de-nicotinized cigarettes most of the oils and acids have been removed from the tobacco and possibly the absence of these substances renders such cigarettes less attractive to the beetle. No significant differences in attractiveness to the cigarette beetle were noted between certain widely advertised brands of medicated cigarettes and commercial cigarettes. Incidentally, it was noted that cigarettes wrapped and sealed in transparent protective coverings are not insect proof so far as this beetle is concerned.

Tobacco fumigation results in decreased losses in exports.--W. D. Reed, of the Richmond, Va., laboratory, reports that, according to recent advices from tobacco dealers, they have suffered no loss from insect infestation in flue-cured tobacco shipped to England during the first 11 months of 1934. In 1931 and 1932 the loss from arbitration over American-grown tobacco exported to England containing living insects exceeded $75,000 each year. This loss was reduced to approximately $60,000 in 1933, and in 1934 there have been no losses from this cause. This great reduction in loss may be attributed principally to the fact that practically all tobacco exported has been subjected to a well-planned fumigation program, in accordance with Departmental recommendations.

Soil composition affects wireworm population.--E. W. Jones and K. E. Gibson, of the Walla Walla, Wash., laboratory, report that detailed studies during the past several years indicate that the mechanical composition of soils in the Walla Walla and Yakima Valleys have a pronounced effect on the abundance of certain species of wireworms. These studies indicate that Limonius canus Lec. is found in from moderate to high numbers in silt loam and very fine sandy loam soils, in moderate numbers in sandy loams and fine sandy loams, but that the population of this species is very low in silty clay loam. Limonius californicus Mann. is found in moderate to high numbers in fine and very fine sandy loam soil. The mechanical analyses of the soils under observation show conclusively that a soil with a high clay content contained comparatively few wireworms and that sandy or silty soils provide a more favorable environment for them.

Mites increase rapidly on bulbs in storage.--C. F. Doucette, Sumner, Wash., in his studies of the bulb scale mite (Tarsonemus approximatus narcissi Ewing) states that the mite population of narcissus bulbs increases much more rapidly in bulbs in storage than in bulbs left in the ground during the summer. This is evidenced in a stock of Chinese lily being grown at the laboratory greenhouse. Most of this stock was allowed to remain in the ground; a few bulbs, however, were dug early in August and kept in open storage until November 1, when they were potted. Severe injury has developed in the potted bulbs but not in those left in the ground.

More on the Mexican mealybug.--H. H. Richardson, of the greenhouse-insects laboratory, Washington, D. C., continuing his studies on Phenacoccus gossypii T. & Ckll., states that both the eggs and active stages of the Mexican mealybug are much more susceptible to calcium cyanide than are those of the citrus mealybug (Pseudococcus citri Risso).

INSECTS AFFECTING MAN AND ANIMALS

Screw worm educational campaign shows results in Georgia.--As the week beginning November 8 was the closing week for most of the work, a status was obtained on the reduction of mortality percentages in areas where educational meetings were held. These figures show that the mortality, as represented by 50 counties, was reduced from 19.4 on September 15 to 12.4 on November 8, notwithstanding an increase in the average number of cases of 1,178 per county on September 15 to 2,852 per county on November 8. During the 6-week program, 18 supervisors held 792 meetings and demonstrations, with a total attendance of 23,041. Each supervisor spent approximately a week in each infested county. The costs averaged approximately $20 per week per man for mileage and subsistence.

Screw worm conferences.--On November 10, at the call of this Bureau, a conference on the screw worm situation in Georgia was held in Atlanta. About 20 representatives of the various Federal and State agencies particularly interested in this important problem were present. F. C. Bishopp served as Chairman. One of the most important results of the conference was the adoption of a series of simple recommendations for the control of the pest, these being based on the research and control experience of this Bureau. The endorsement of a single set of recommendations by all agencies will undoubtedly aid in getting farmers to adopt the most effective methods of combating the pest. Means of furthering the educational program of the Department, of checking the sale to farmers of ineffective remedies, and of reducing the danger of forest burning were discussed at length. There is a serious problem in protecting woods and forests from fires set by stock owners in their belief that the burning over of pasture areas will control the Gulf coast tick, which is an important factor in inducing screw worm attack on all classes of livestock. It was the consensus of opinion that burning would accomplish little good and might cause great destruction of young trees and wild life. On invitation, W. E. Dove, Charleston, S. C., addressed the county agents of Florida at their annual meeting in Gainesville on the subject of screw worms.

Screw worm status in Florida.--To obtain data on the results of education in screw worm control, W. V. King, Orlando, Fla., sent a questionnaire to each supervisor of the educational campaign in the State, asking for information on the present screw worm status and for an estimate of the percentage of cases due to different causes. A preliminary summary of 11 of the replies gives the following percentages in cattle and hogs.

Cause	Cattle	Hogs
	Percent	Percent
Marking	13.5	20.0
Branding	5.2	--
Castration	12.8	32.3
Dehorning	9.7	--
Attack of ear ticks	24.4	10.0
Navel infestation in new born animals	22.3	6.8
Other infestation in new born animals	3.6	6.4
Accidental injuries	5.9	16.6
Other causes	3.0	7.9

The replies indicated that the November status of screw worm infestation ranged from only a "slight improvement" to a "90 percent reduction." The reductions were attributed to the combined effect of cooler weather and better care of cases. Several reports have been received of the development of new cases following the first heavy frost (with a minimum temperature of about 30° or 31° F.). Two additional counties, Osceola and Lake, reported scattered cases during the month, bringing the total number of infested counties to 57.

Screw worm control in Mississippi.--All of the county supervisors were released at the end of the week ending November 1. One of these supervisors and one clerk were left in charge of the office work at Hattiesburg and the four division supervisors remained to follow up the work with the county agents to the week ending November 29. These men also took soil temperatures during the period and in the southern counties made a general survey of the Gulf coast tick. Very few ticks were found in any of the counties during the month. A considerable number of screw worm cases were found the first half of the month, but few or none were reported during the last week of the work.

Blowfly parasite work.--A. W. Lindquist, of the Uvalde, Tex., laboratory, has continued in charge of the blowfly parasite work at the laboratory, and 16,081 Alysia ridibunda Say emerged during the month, 12,855 being released in the vicinity of Uvalde. This makes a total of 22,075 of these parasites released during October and November. Emergence of Psilodora spp. was 1,880, and 110 specimens were released. Apparently a good stock of each parasite was in hibernation at the end of November. Mormoniella vitripennis (Walker) has bred quite freely at the laboratory during the fall and it is quite possible that this parasite will be found of considerable value in fly control.

Sand fly to be studied in Bahamas.--During the latter part of the month (November) J. B. Hull, of the Savannah, Ga., laboratory, went to the Bahama Islands for an investigation of the sand fly problem at Nassau. Arrangements were made through official channels and funds were furnished for his expenses by the American residents of Nassau.

FOREIGN PLANT QUARANTINES

Recent entomological interceptions of interest.--Eighty living larvae of the Mexican fruit fly (*Anastrepha ludens* Loew) were intercepted last June at Del Rio, Tex., in 16 mango fruits in baggage from Mexico. Twelve living larvae of the Mediterranean fruit fly (*Ceratitis capitata* Wied.) were intercepted last August at New York in two pears in baggage from Italy. This fruit fly was also taken at San Pedro, Calif., in longan (*Litchi chinensis*) fruits in ship's quarters from Hawaii. A living adult of *Physorrhinus frontalis* Cand. arrived at Mobile, Ala., on a banana fruit in cargo from Honduras. This wireworm is not recorded from the continental United States. A living specimen of the earwig *Anisolabis stali* Dohrn was found at Seattle, Wash., in a lily bulb in cargo from Japan. A living specimen of *Sciocoris longifrons* Barb. was taken at Washington, D. C., on an orchid plant in the express from Mexico. An orchid, *Dendrobium taurinum*, arriving last June at Honolulu, Hawaii, in cargo from the Philippines, was infested with an adult of the curculionid *Tadius erirhinoides* Pascoe. A living adult of *Micrelus ericae* Gyll. (*Ceutorhynchus ericae* Gyll.) was intercepted at Baltimore on dried heather in the mail from Scotland. Living larvae of this weevil were also taken at Philadelphia on dried heather in the mail from the same country. A living larva of the pyralid *Pionea forficalis* L. was found at New York on a cabbage leaf in stores from Belgium. Living specimens of the termite *Cryptotermes piceatus* Snyder were intercepted at San Francisco with bamboo packing around a shipment of candles in the mail from Hawaii. A living adult of the wireworm *Aeolus yucatanus* Champ. was taken at Philadelphia with banana debris in cargo from Mexico. A living adult of the anthribid *Eugonus subcylindricus* Fab. was found last June at New Orleans in a hardwood log in cargo from Mexico. Living larvae and adults of *Scolytus scolytus* Fab. were intercepted last October at Norfolk, Va., in elm logs in cargo from France. Adults of *Bruchidius halodendri* (Gebler) were taken at Philadelphia in seed pods of licorice (*Glycyrrhiza glabra*) in cargo from Greece. This bruchid is not recorded from the United States.

Recent pathological interceptions of interest.--*Bacterium savastanoi* EFS was intercepted at Philadelphia on an olive branch from Italy. *B. vesicatorium* Doidge was intercepted at New York on two shipments of tomatoes from Cuba. A bacterial leaf spot was intercepted at New York on primrose leaves from France. Stevenson's Manual and Department Bulletin 1366 fail to list such a disease. *Cladosporium fulvum* Cke. and *Oospora lactis parasitica* F. J. Pritchard and W. S. Porte were intercepted November 20 at Mobile on tomatoes from Argentina for the first time. Our first interception of *Erysiphe cichoracearum* DC was made at Boston on November 19, the host being chrysanthemums from England. *Godronia cassandrae* Peck was found in a sample of lingon berries taken by New York inspectors from a shipment from Newfoundland on November 16, and *Leptosphaeria sacchari* Van Breda de Haan was intercepted at New York on November 20 on sugarcane leaves from Cuba. The two previous interceptions of this disease were made in 1920 from Spanish Honduras and in 1921 from the Philippines. What appeared to be a *Phoma* sp.

with minute spores was found on a small diseased spot on a papaya fruit from Brazil intercepted at New York. *Puccinia chrysanthemi* Roze was found November 9 at New York on chrysanthemums from Germany. The only previous interception of this rust was from Mexico. A *Sclerotium* sp. producing numerous sclerotia resembling those of *S. rolfsii* Sacc. was intercepted at Detroit in a shipment of taro from China. The presence of *Tranzschelia pruni-spinosae* (Pers.) Dietl. on leaves in a basket of string beans enabled us to determine them as *Prunus* sp. The material was from France and taken at New York. Our first interception of *Uromyces glycyrrhizae* (Rabh.) P. Magn. was made November 19 at Philadelphia on licorice leaves from Greece. Large weathered scabs of *Venturia inaequalis* (Cke.) Aderh. were found on the fruit of *Sorbus* sp. on November 21 at New York in baggage from Italy, our first interception of the disease on this host. Nematode interceptions included *Anguillulina dipsaci* (Kühn) Gerv. and v. Ben. on potatoes from France at Mobile, from Germany at Mobile and New York, and from Finland at Philadelphia; *A. pratensis* (de Man) Goffart (2), *Aphelenchoides parietinus* Bastian and *Heterodera marioni* (Cornu) Goodey on lily-of-the-valley at New York; our first interception of *Aphelenchus avenae* Bastian from Peru, in potatoes at New York; and *Acrobeles* n. sp. in tuberose from Mexico at Nogales on October 26.

Another disease on Cuban lima beans.--Several interceptions of diseased lima beans were made at New York during November in shipments from Cuba. In addition to *Elsinoe phaseoli* Jenk., *Colletotrichum lindemuthianum* (Sacc. and Magn.) Briosi and Cav., and *Fusarium* sp., which have been intercepted on numerous occasions in previous years, a few lesions of *Cercospora* sp. and *Colletotrichum* sp. and a number of lesions of a *Vermicularia* were found. The latter appears to be the same species reported as occurring in Georgia, North Carolina, and Virginia and determined as *V. polytricha* Cke. (see Plant Disease Reporter 15: 113-114, Sept. 1, 1931). The specimens fit the description of *Colletotrichum caulicolum* Heald and Wolf on Kentucky Wonder beans as given in a plant-disease survey in the vicinity of San Antonio, Tex. (see U. S. D. A., B. P. I. Bul. 226: 35-36), and may be identical with that species. Further study is needed to clear up the relationship of these and other diseases reported on beans.

New pest of lily bulbs.--A new species of *Aphelenchoides* was found heavily infesting a diseased lily bulb in a shipment en route from Japan to Chicago and was intercepted at Vancouver, B. C. According to G. Steiner, of the Bureau of Plant Industry, the species more closely resembles certain forms found in connection with wood-boring insects than it does forms usually found in plants similar to lilies. The females are equipped to lay relatively large numbers of eggs. Associated with the *Aphelenchoides* n. sp. is a species of *Diplogaster* that also appears to be new.

Potato weevil larvae taken.--Living larvae of the potato weevil (*Epicaerus cognatus* Sharp) were intercepted in September and October 1934 in tubers of potato (Solanum tuberosum) in baggage from Mexico at Brownsville, Eagle Pass, Hidalgo, and Laredo, Tex. The first positive interception record of this insect was on May 11, 1923, at New Orleans, La., in potatoes from Vera Cruz, Mexico. The larvae render potato tubers unfit for human consumption. Because of the serious injury by this weevil, the Mexican Government has promulgated an interior quarantine placing certain restrictions on the movement of potatoes from infested municipalities in the States of Tlaxcala, Puebla, and Vera Cruz, to uninfested territory.

New nematode appears.--Recently a 2-ounce mail shipment of Eugenia seed arrived under permit at the Washington, D. C., inspection house from the experimental gardens of the Canal Zone. Examination of injured seeds in the package revealed the presence of live threadworms curled up in the dead tissue. After a study of the eelworm specimens Dr. Steiner reports them to be apparently a new species of the nematode genus Hexamermis, a group of insect parasites. One insect larva, apparently not diseased, was found in the seeds and returned for determination. Whether this species represents a host or whether some other insect is involved is not certain.

DOMESTIC PLANT QUARANTINES

Transit inspection.--The first instance of an air shipment of rooted plants moving in violation of a Federal domestic plant quarantine to come to the attention of this Bureau was recently reported by a California State inspector at Los Angeles. It consisted of 100 rooted gardenia cuttings shipped from a point in New Jersey without a Japanese beetle certificate attached. The incident is of special interest for the reason that air shipments of plant material consist chiefly of cut flowers. During the period from October 16 to June 14, however, no certification of cut flowers or portions of plants without roots and free from soil is required under the Japanese beetle quarantine.

Citrus canker.--In Texas the field agent was able to obtain the destruction on November 26 and 27 of the five trees in Galveston and Brazoria Counties on which citrus canker had been found in the fall inspections. These infections had been called to the attention of the two owners who agreed to allow eradication if evidence of infection continued. Inspections were also made of trees in the Smith Point area in Chambers County and of areas in Hidalgo and Cameron Counties, where the disease had been known to occur in previous years. No citrus canker was found in these three counties this season. In all five counties, 532,676 trees were inspected in November. In Louisiana inspections were made during the first half of November on all properties on which trees were growing in Ascension, Beauregard, Jefferson, and St. Charles Parishes. The work covered 14,683 trees in groves and 24,048 in nurseries. No evidence of infection was found.

Phony peach projects to be consolidated.--The prevention of spread of the phony peach disease, and the closely coordinated project dealing with the eradication of this disease, have for some years been carried as two distinct projects with headquarters at Atlanta, Ga., and Fort Valley, Ga., respectively. Since both projects are now under the direction of the Division of Domestic Plant Quarantines, it has been arranged, in the interest of economy and efficiency, to consolidate them on January 1, with headquarters at the Peach Disease Laboratory, Fort Valley, Ga. William F. Turner will be in charge.

CONTROL INVESTIGATIONS

Why cabbage worm is not poisoned by eating pyrethrum.--M. C. Swingle, Takoma Park, Md., has already shown that pyrethrum is not toxic when eaten by the imported cabbage worm, but is very toxic when applied to the external surface of the body. To find out whether the toxicity of pyrethrum is destroyed in the alimentary tract, worms were allowed to feed on sandwiches containing a known quantity of pyrethrum powder. Similar sandwiches were set aside as checks. The excrement of the larvae that had fed on pyrethrum was collected, dried, and pulverized. The check sandwiches were also dried and pulverized. Fresh larvae were then dusted with these two samples of powder. The check samples killed all larvae within an hour, whereas the sample that had passed through the alimentary tract was not toxic, demonstrating that these pyrethrins had been decomposed in the gut of the cabbage worm.

Nicotine bibliography nears completion.--N. E. McIndoo, Takoma Park, has accumulated 4,830 abstracts on tobacco and nicotine during this year. The classification of these abstracts preparatory to publication is now under way.

BEE CULTURE

Bee venom apitherapy.--Jas. I. Hambleton, Somerset, Md., reports that the Bee Culture Laboratory at Somerset, Md., has been receiving an unusual number of requests from doctors for information relative to the use of bee venom for the treatment of certain types of rheumatism. The successful use of bee venom for the treatment of rheumatism has been reported from time to time in foreign medical and biological journals, and advertisements in foreign medical journals are now appearing for bee venom put up in the form of salve or for direct injections with a hypodermic needle. In this connection it will be of interest to American doctors and apicultural workers to learn that a book by an American doctor, Bodog F. Beck, entitled, Bee Venom Apitherapy, is announced by D. Appleton-Century Company and will be available in January.

Recently imported "long-tongued" bees prove disappointing.--The Caucasian bee is known as a long-tongued bee, representative strains having an average tongue length longer than that of the Italian. The yellow coloration typical of the Italian is missing. In contrast to the Italian, the Caucasian is marked by bands of gray hairs on the tergites. W. J. Nolan reports that the Bee Culture Laboratory at Somerset, Md., and Herman Rauchfuss of Colorado, came into possession this summer of two queens from Russia, supposedly of the strain of Caucasian bees with the longest tongues recorded. However, the progeny showed some yellow coloration, while average tongue lengths of samples of workers reared from these queens proved no longer than those of a long-tongued strain of some other races. This shortness of tongue is not to be ascribed to any geographical change, because progeny of a similar shipment a few years ago had tongue lengths typical of the strain in question. The disappointing results of last summer's importation are to be ascribed to the great difficulty in keeping races and strains of bees pure under natural apiary conditions.

Tahiti bees affected by Nosema-disease.--Several importations of adult honeybees from the Island of Tahiti recently examined at the Somerset laboratory by C. E. Burnside were all found to be heavily infected by Nosema. The variation in the morphology of the spores was somewhat greater than is usual in the cases of Nosema apis from this country which have been examined at the laboratory. When the Nosema spores were mixed with sugar syrup and fed to bees in cages, practically all these bees were attacked by Nosema-disease. The length of life of affected bees appeared to be considerably shortened. The diseased bees lived less than half as long as other bees that were kept under similar conditions except that they were not given spores. In this country Nosema-disease sometimes causes a heavy mortality among bees in the winter and early spring, but in the summer and autumn the disease generally subsides, so that considerable searching is usually necessary to find a single infected bee. Although the climate in Tahiti is always mild, more than half of the bees in all the samples received from that island were found infected by the protozoan parasite. The death rate during transit was always high and in most of the cages all the bees were dead on arrival.

Colony population and production.--C. L. Farrar, of the Intermountain States Bee Culture Field Laboratory, Laramie, Wyo., reports that a high positive coefficient of correlation (0.8556), representing 135 records, was again obtained between the colony population and the production for a third season's data, 1934, when the intensity of the honey flow was standardized. The production factors per thousand bees determined from the slope of the regression equation for colony populations of 15, 30, 45, 60, 75, and 100 thousand bees per colony were 1, 1.22, 1.29, 1.33, 1.35, and 1.38, respectively. These factors show a similar trend to those obtained from three previous groups of colonies producing in 1932 and 1933, and indicated a marked advantage in having colonies strong for maximum honey production per unit of bees. During this season (1934) several colonies were developed beyond the normal maximum population of 60,000 bees by maintaining two queens with active broodnest for a 6-week period. Twelve records were obtained over this maximum, ranging from 65 to 98 thousand bees, and their production records fell very close to the standard regression lines. Variations in the regression lines for

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the seasonal segments indicate a greater advantage in maximum strength colonies during periods of low production, or light honey flows, than during high production, or intense honey flows.

Oregon beekeepers ask the adoption of honey grades and U. S. standards.--F. E. Todd, of the Pacific States Bee-Culture Field Laboratory, Davis, Calif., reports that, at a recent convention of the Oregon State Beekeepers' Association held at Portland on November 9 and 10, the beekeepers asked the State Department of Agriculture to take the necessary steps to enforce the marketing of the 1935 honey crop in accordance with recently enacted legislation which gave the State Department of Agriculture authority to enforce regulations dealing with honey-container sizes and with the grading of honey. The beekeepers desire that the grades on honey promulgated by the U. S. Department of Agriculture be used on the one hand and the standards proposed by the Division of Simplified Practice of the Bureau of Standards be applied with respect to containers. Mr. Todd reports that undoubtedly this action can be traced more or less directly to the results of the survey carried on by the Davis laboratory in conjunction with the Giannini Foundation of the University of California. Results of the survey are reported in Bulletin 554, entitled, Honey Marketing in California.

IDENTIFICATION AND CLASSIFICATION OF INSECTS

A new chrysomelid for the National collection.--Recently, H. S. Barber has identified as (?) Anisostena bicolor Smith specimens received for identification from Donald A. Wilber, Manhattan, Kans., which were reared from leaves of gama grass. This species has not been represented previously in the collection at the National Museum.

Another Serica found in Maryland.--During the week of November 12, A. G. Boving identified as Serica similis Lewis about 25 specimens of a scarabaeid larva collected at Beltsville, Md., on chestnut trees brought in from Long Island.

Specialist studies weevils in Philadelphia.--In connection with the identification of some Cuban weevils submitted by S. C. Bruner and A. R. Otero, L. L. Buchanan spent November 23 at the Philadelphia Academy of Natural Sciences, studying the Curculionidae in the Poey collection of Cuban beetles.

Specialist honored by Panama.--In recognition of his contributions to the knowledge of the tropical microlepidoptera of Panama and neighboring countries, August Busck has been elected an honorary member of the Panama Canal Natural History Society.

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